

Before attempting to expound a new section, I endeavour to explain the purpose which this section serves, for as King Solomon stated: "A fool hath no delight in understanding, but that his heart may discover itself." (Prov. xviii. 2.)

In small type I have given many of the explanations that a good teacher requires with his pupils in the class room, but never includes in his printed manual. This peculiarity makes my book useful for self-instruction.

The beginning of all mathematical study is easy. The difficulty begins later, because it is indispensable to know what has already been studied for the understanding of what follows. Therefore my arrangement permits even the youngest pupils to learn something applicable to the practice of calculation.

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### THE NATIVE QUESTION IN SOUTH AFRICA.<sup>1</sup>

IT cannot be too often repeated or too strongly impressed on the public mind of this country that by far the most difficult problem of South Africa is, not that of the relations of the white populations to one another, but that of the relations of the white population to the "Natives," and of the Natives to one another. It involves questions not to be solved by any process of patching. The ordinary "short view" recommended by European statesmen in treating European problems will not do. To deal with these questions effectually, considerations of a far-reaching economic and anthropological character are necessary. We must understand the Native mind, we must endeavour to see things from the Native point of view, we must consider the Native prejudices and aspirations as well as what we, from our point of view, regard as the Natives' best interests, and we must take into account their physiological and mental condition, and the influence upon it of the changes which have begun and the further changes impending.

It is thus evident that, before any final steps can be taken, a full inquiry into these matters must be held. Until the end of the war such an inquiry would be difficult. Consequently, all that can be done at present is to legislate on the most urgent points, so as to obtain a temporary *modus vivendi* on the labour contracts and the liquor laws. This is all that Lord Milner has yet attempted. But his despatches to the Colonial Secretary, and the important memorandum by Sir Godfrey Lagden, comprised in the papers recently presented to Parliament, though relating chiefly to the proclamations on the two subjects just mentioned, disclose the fact that the authorities are not insensible to the wider principles which must underlie our future policy. Lord Milner fully recognises the need of uniformity throughout British South Africa, and looks forward to a Native code to be framed by a Federal Parliament. It is satisfactory to learn from him that "the best colonial sentiment" as to our treatment of the Natives "is not far removed from the best home sentiment, as represented, for instance, by temperate and reasonable advocates of Native rights," such as the authors of "The Natives in South Africa," reviewed in these columns last May. What is wanted is that such sentiment should be controlled and directed by full and accurate information.

The Anthropological Institute and the Folklore Society have already petitioned Mr. Chamberlain to order a full and systematic inquiry into the Native laws and customs in our new colonies at the earliest possible moment. The authors of the book just referred to, whom Lord Milner mentions with so much approval, speak of the want of such an inquiry as "urgent." It is the only satisfactory way to provide the information required for the guidance of public sentiment, and of the administration; and if the example of Cape Colony be

of value, it must precede any comprehensive attempt at legislation. The readers of NATURE are primarily interested in its scientific aspect. It is needless to reproduce the arguments they have had before them more than once. Those arguments are reinforced by Lord Milner's protests against some of the statements made on behalf of the Anti-Slavery Society and the Aborigines Protection Society in these papers, and by Sir Godfrey Lagden's admission that "there is much yet to be learnt by those who are vested with the control of Native affairs." And, though there is no allusion to the matter in the despatches now printed, we may be allowed to indulge the hope that it will not be overlooked as soon as the country is sufficiently pacified to enable the Government to arrange for it. Meanwhile, every opportunity should be taken by scientific anthropologists and jurists to bring their views before ministers and members of Parliament.

### THE JUBILEE OF THE AUSTRIAN METEOROLOGICAL CENTRALANSTALT.

TO celebrate the fiftieth year of the existence of the Central Institute for Meteorology and Earth's Magnetism, the Vienna Academy has published a jubilee volume,<sup>1</sup> the contents of which form a very valuable contribution to science and an appropriate publication for this important celebration. This Central Institute, which is now the hub of all the meteorological and magnetic work carried on in the Austrian Empire, came into existence on July 23 in the year 1851, and it was founded with the object, first, of coordinating a number of stations all over the country and making them work on a uniform plan, and, second, of collecting such observations. How well these two objects have been carried out is familiar to every meteorologist of to-day, and so successful an issue of this organisation has been due to the consecutive labours of such directors as Kreil, Jelinek, Hann and Pernter, who have kept the Institute in such an excellent state of efficiency.

In the present volume we are first made acquainted with a brief history of the events which led up to the formation of the Institute, and the progress made during the period of office of each director. This is written in the form of an introductory chapter by the present director, Prof. Pernter. It is interesting to read that in the year 1851 Director Kreil had only forty stations working on a uniform plan carefully prepared by the Institute, but eleven years later he had increased the number nearly threefold. At this early stage there was a great amount of work to be accomplished, and Kreil, among other things, brought out the useful and valuable year book which was considered at the time a "modèle à suivre." The collection of old observations formed an important duty at this period of the Institute's history, and the first few volumes published contained long series of valuable observations made at Wien (1775-1850), Mailand (1763-1850), Prag (1775-1851), Kremsmünster (1763-1851), Salzburg (1842-1851), Udine (1803-1842), Fünfkirchen (1819-1832), Stanislaw (1839-1850), and several other stations.

As time went on, the Institute, like many others, began rapidly to accumulate more work than it could accomplish, and this necessitated an increase in the staff and a greater output of publications. By the year 1877, 238 stations were sending in their results, while twenty years later this number had increased to 447; last year the number of first, second and third class stations together was 420.

To come now to the series of valuable articles which form the substance of this large volume, it may, in the

<sup>1</sup> "Transvaal. Papers relating to Legislation affecting Natives in the Transvaal." Presented to Parliament, January 1902.

<sup>1</sup> "Denkschriften der kaiserlichen Akademie der Wissenschaften." *Mathematisch-Naturwissenschaftliche Classe*, vol. lxxiii.

first place, be remarked that as these cover no less than 600 pages, only a very brief reference can be made to each of them.

The first contribution, by the distinguished late director of the Institute, Hofrath Julius Hann, is a masterly discussion of the meteorological observations made at the Institute during the years 1852-1900. This paper brings together the monthly and yearly means of each of the meteorological elements during this period, and in two cases—namely temperature and rainfall—the data given extend back to 1775 and 1845 respectively. Such a long series of temperature observations has enabled him to investigate them for secular variations, with the result that he has found the anomalies to conform to a variation having a period of thirty-five years. It may be of interest here to mention that quite recently Hann has shown (*Kais. Akad. d. Wiss. Jahrg. 1902, No. 1, p. 5*) that the rainfalls of Mailand, Padua and Klagenfurt have also a secular variation of thirty-five years, the years of maxima and minima corresponding with Bruckner's epochs.

Next follow two papers relative to the "Föhn." The first is by Dr. Paul Czermack, in which he describes some experiments that serve to illustrate details in the behaviour and appearance of these currents. The second communication, by Dr. Robert Klein, deals with the daily variation of the meteorological elements at Tragoss due to the occurrence of the "Nordföhn," and he finds that all the elements are regularly disturbed by it, and offers an explanation for these variations.

The influence of the "Bora" on the daily period of some of the meteorological elements is discussed by Herr Eduard Mazelle. The observations were made during the years 1886-1895 at the astro-meteorological observatory in Trieste, and the results indicated that the elements changed definitely on these occasions.

A comparatively short paper, by Dr. Victor Conrad, describes the experiments and observations that he has made to investigate the water capacity of clouds and mists. In the first instance he devoted his time to the study of the "aspirationsmethode," producing artificial mists by means of a small boiler. The author then applied this method to natural clouds and mists, making his observations at elevated stations such as Schneeberg, Waxriegel (1884m.), Schafberg (1798m.), and Hohen Sonnblick (3106m.). The results are a distinct advance on earlier determinations, and, in addition, serve to explain some anomalies previously observed by other workers; thus, to take one case, the curve illustrating the relation of the water capacity to the "seeing distance" (in the mist) in metres shows clearly the difficulty of measurement of the water capacity when the seeing distance reaches about 150 metres.

We come now to two papers dealing with the daily variation of the temperatures in Austria and at Vienna (Hohe Warte), by Drs. J. Valentin and Stanislav Kostlivy respectively. Both these communications are exhaustive investigations on these meteorological elements, but even a brief reference to them must be omitted.

Dr. J. Pircher is the author of an important memoir on the hair-hygrometer. He first discusses the hair from the point of view of a hygroscopic substance, and describes in detail the features and peculiarities of different hair-hygrometers. This is next followed by a minute experimental investigation of the hair-hygrometer and its capability of indicating efficiently the phenomena it is intended to record. Comparisons of the hair-hygrometer with the condensation hygrometer of Alluard, with the psychrometer, the aspiration psychrometer of Assman, &c., are then given, concluding with deductions as to the sensitiveness of the hair-hygrometer and the influence of the action of direct sunlight upon it.

Some of the results at which the author has arrived, to put them in a few words, are, that the relative humidity

can under all circumstances be measured to within five per cent., but in most cases to three per cent.; that the efficiency of the instrument is considerably decreased if it be allowed to stand for a long period of time in a room of constant humidity, it being pointed out that it is not only advisable, but necessary, to occasionally moisten the hair; and, finally, that temperature (with the exception of direct sunlight) and wind velocity have no effect on the instrument, while no variation was observed in the case of pressure.

A valuable paper by Prof. J. M. Pernter gives the results of some interesting experiments on the polarisation of light in cloudy media and their connection with the present explanation of the blueness of the sky. This investigation was undertaken to answer, if possible, the question whether the light of the sky (*Himmelslicht*) considered as scattered light of a cloudy medium, and the blue of the sky (*Himmelsblau*) as the colour of a true medium, could be more easily and, perhaps, also finally answered by the behaviour of light in relation to polarisation than by measurements of the intensity of single colours, since the latter, both with artificial cloudy media and with skylight, are connected with great experimental difficulties. Prof. Pernter used for the media different percentages of liquids coloured in such a way that he could employ all gradations of colour from the finest blue to a tone of milky white. Through these liquids he allowed rays of different colours to pass, and examined them after transmission by means of a polarimeter. In the summary of the results arrived at it will be seen that an important step in advance has been made from the experimental standpoint, and the observed facts are in harmony with the well-known theory of Lord Rayleigh.

The last two papers in the volume, which can here only be referred to by their titles, are written by Drs. Max Margules and Wilhelm Traberto, and are on "The Value of Work (*Arbeitswert*) of a Pressure Distribution and on the Preservation of Pressure Differences" and "Isotherms of Austria" respectively. In the latter the author has used, whenever possible, the fifty-year means of temperature, and has employed the values obtained from 773 stations in Austria and 142 outlying places; the maps accompanying the paper illustrate the isotherms for the months of January, April, July and October, the isotherms for the whole year, together with four other maps showing the isotherms for special regions.

In bringing this necessarily brief digest of the contents of this important volume to a conclusion, one cannot but call to mind the very valuable service this Central Institute of Meteorology has rendered to meteorological science in general. The numerous voluminous publications which have issued from its doors, and the very able help it has provided and still provides in many directions, are sufficiently well known to indicate the great activity that is displayed in its various departments. The publication of the volume before us is not only a fitting outcome of such labours, but is a worthy tribute to the memory of those who have striven to place the Institute in the first rank, in which it stands to-day.

W. J. S. L.

#### THE OWENS COLLEGE JUBILEE.

ON March 12, 1851, the Owens College began its existence in a modest house in the centre of Manchester which had formerly been inhabited by Richard Cobden. The College was removed to its present site in Oxford Street in 1873; since that date one addition after another has been made to the buildings, which now cover an irregular area of some 240,000 square feet.

The chemical laboratories have been twice enlarged,